**STATE OF SOUTH CAROLINA**

**BEFORE THE PUBLIC SERVICE COMMISSION**

**DOCKET NOS. 2017-207-E, 2017-305-E, AND 2017-370-E**

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| IN RE:<br><br>Friends of the Earth and Sierra Club,<br>Complainants/Petitioners<br><br>v.<br><br>South Carolina Electric & Gas Company,<br>Defendant/Respondent | ) |
| IN RE:<br>Request of the Office of Regulatory Staff for Rate Relief to South Carolina Electric & Gas Company's Rates Pursuant to S.C. Code Ann. §58-27-920 | ) |
| IN RE:<br><br>Joint Application and Petition of South Carolina Electric & Gas Company and Dominion Energy, Inc. for review and approval of a proposed business combination between SCANA Corporation and Dominion Energy, Inc., as may be required and for prudency determination regarding the abandonment of the V.C. Summer Units 2 & 3 Project )and associated merger benefits and cost recovery plan. | ) **FRIENDS OF THE EARTH AND SIERRA CLUB BRIEF AND PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW** |

It is now abundantly clear that SCE&G's new nuclear venture to construct two massive and untested Westinghouse AP-1000 nuclear generating plants represents a blunder of unprecedented proportions, with attendant injurious consequences for virtually all parties concerned. While virtually all other electric utilities rejected the new nuclear gamble after investing only modest preliminary planning sums, SCE&G foolishly persisted in pouring good money after bad into what we now know to be two very costly abandoned holes in the ground. The question is inescapable: what did all of the rest of the electric utility industry know that SCE&G chose to ignore? The answer to that question compels the conclusion that the costs of this failed project were imprudently incurred in light of the information available to SCE&G, as well as to all the other utilities which chose the prudent alternative course. It is now this Commission's awful duty to sort out the proper balance of responsibility among the interests which are subject to its regulatory authority and to chart a path forward for South Carolina's energy future; consistent with the requirements of law.

It is now established that virtually all of the parties to these proceedings, except the utilities, agree that substantial portions of the costs of the abandoned Summer nuclear project were imprudently incurred, that the project should have been abandoned as imprudent at an earlier date, and that charging ratepayers for such imprudently incurred abandoned project costs should be disallowed by this Commission. The non-utility parties differ only on the date after which such imprudent costs should be disallowed, as triggered by the recently disclosed internal utility records reflecting

such overwhelming imprudence. The existence of such secret internal documents reflect a fundamental failure by the utility to honor its duty of disclosure to the regulators- ORS and the Commission- of the material information regarding the nuclear project needed to assure effective regulatory oversight and consumer protection. That duty of disclosure is imposed by generally accepted principles of utility regulation as well as by the provisions of the Base Load Review Act and other statutes. The ORS has concluded that such conduct by SCE&G in abusing its duty of disclosure to regulators amounted to "fraud" and imprudence as expressly defined by the amended BLRA . The ORS and intervening parties differ only on the date when such utility imprudence should trigger abandoned project cost disallowance. Friends of the Earth and Sierra Club have contended from the very inception of this project in 2008 that it was an imprudent and reckless gamble and that facts known to the utility industry generally demonstrated that the project would fail to deliver its promised economies, compared to far less risky and cheaper alternatives

Friends of the Earth and Sierra Club, ORS and AARP each point to internal utility records, concealed from regulators, identified during discovery and only post-abandonment, as triggering an imprudence determination and disallowance of the abandoned project costs. South Carolina Energy Users Committee argues that SCE&G has lost the benefits of the BLRA bargain and the right to cost recovery when it departed from the Commission approved budget and schedule to construct the plant. The Coastal Conservation League and Southern Alliance for Clean Energy focus on the need for merger conditions to protect ratepayers from unjust and unreasonable rates

through mandatory competitive bidding for future energy resources and for protections against self dealing in resource and services affiliate transactions.

Perhaps most importantly, we point to the need for serious root cause assessment of the causes and related corrective action for the grave misconduct committed by utility management in fraudulently communicating with its regulators. In order to assure a properly functioning regulatory system in the future it is essential that an effective plan is developed and executed to assure non recurrence and appropriate sanctions against responsible personnel. A code of conduct to govern the utility's relations with regulators, which assures honest, transparent and full disclosure of all material information. must be required of the utility in order to assure that such massive utility imprudence as we now contend with cannot happen ever again.

## A. MULTIPLE ALTERNATIVE CLAIMS SUPPORT RELIEF FOR RATEPAYERS

The non-utility parties advance a number of alternative legal claims which provide multiple bases for the Commission to provide relief for ratepayers from the continued burden of paying the utilities for recovery of and on the capital costs associated with the useless abandoned nuclear project. Such alternative claims range from relief driven by the unconstitutional-as-applied Baseload Review Act (BLRA); include recognition that the utility was no longer entitled to the rate recovery benefits of the BLRA once the utility was no longer constructing the plant in accordance with the Commission's order; rely on the imprudence of the utility in failing to abandon the project at a much earlier time in light of the information then available; and include the utility's fraudulent misleading conduct and non-disclosure of material information on

project imprudence from regulators and this Commission. Friends of the Earth and Sierra Club support each of these alternative claims, advanced by various parties, to the extent that such claims provide maximum protection for ratepayers from unjust responsibility for the costs of the failed nuclear project.

## 1. THE BASELOAD REVIEW ACT IS UNCONSTITUTIONAL AS APPLLIED AND ALL RATES CHARGED THEREUNDER ARE VOID

In its Brief of Attorney General in Opposition to SCE&G's Motion to Dismiss, November 21, 2017, Attorney General Wilson argued that the Baseload Review Act (BLRA) is unconstitutional as applied where it takes money from ratepayers and gives it to investors of a private company for a private use for a utility plant which is now abandoned and not "used and useful" in producing utility service to ratepayers, contrary to the public interest and in violation of Article I, Section 13(A) of the South Carolina Constitution. The AG urged the Commission to exercise its authority to so conclude, citing Travelscape, LLC v. SC DOR, 391 S.C 89, 705 S. E.2d (2011) and Dorman v. Dept. of Health & Envtl. Control, 350 S.C. 159, 565 S.E.2d 119 (Ct. App. 2002), for the proposition that the Commission, as an executive agency, retains the jurisdiction and authority to determine whether the BLRA, as applied, deprives ratepayers of their constitutional rights.

In its Brief Opposing SCE&G's Motion to Dismiss, November 21, 2017, the South Carolina Energy Users Committee (SCEUC) joins the Attorney General's position and argues that where the Baseload Review Act is unconstitutional as applied, all actions taken thereunder are void as a matter of law; and the parties must be restored to their circumstances prevailing prior to the issuance of Order No. 2009-104(A). SCE&G must

cease collecting any and all revised rates approved pursuant to the BLRA. The Commission is urged to set a hearing to determine the manner and terms by which SCE&G will refund to its ratepayers all rates charged pursuant to the BLRA by credits or otherwise.

Friends of the Earth and Sierra Club support the positions of the Attorney General and SCEUC that the BLRA is unconstitutional as applied and join in the relief sought by SCEUC.

**2. WHERE SCE&G WAS AND IS NO LONGER CONSTRUCTING THE NUCLEAR PLANT WITHIN THE PARAMETERS OF THE COMMISSION'S COST AND SCHEDULE ORDER IT IS NO LONGER ENTITLED TO CHARGE RATES OR RECOVER COSTS OF THAT ABANDONED PLANT**

Various parties including the South Carolina Energy Users Committee have argued before the Commission that SCE&G lost the benefit of the BLRA bargain when it ceased construction of the nuclear project "within the parameters" of the approved Commission construction and capital cost order.

> (A) A base load review order shall constitute a final and binding determination that a plant is used and useful for utility purposes, and that its capital costs are prudent utility costs and expenses and are properly included in rates so long as the plant is constructed or is being constructed within the parameters of:
>
> (1) the approved construction schedule including contingencies; and
>
> (2) the approved capital costs estimates including specified contingencies.

S.C. Code Ann. Section 58-33-275(A).

Such construction "within the parameters" clearly ended upon abandonment on and after July 17, 2017; but substantial evidence in the record supports findings that long before that final date SCE&G was constructing the

plant under a completion schedule and capital cost well beyond the parameters of the prevailing Commission order contrary to the requirements of the BLRA. ORS has pointed to undisclosed SCE&G internal EAC or Estimate at Completion assessments and the once secret Bechtel schedule assessment as information fraudulently withheld from ORS and the Commission reflecting such out-of-compliance status for the project's construction.

Friends of the Earth and Sierra Club support these positions and urge the Commission to determine that SCE&G is no longer entitled to the benefits of the BLRA.

3. **WHERE SCE&G HAS FRAUDULENTLY LIED, MISLED OR WITHHELD MATERIAL INFORMATION REGARDING THE PRUDENCE OF THE NUCLEAR PROJECT FROM ORS OR THE COMMISSION IT IS NOT ENTITLED TO RECOVER COSTS OF THE ABANDONED PLANT**

The Office of Regulatory Staff (ORS) has reached the unprecedented, disturbing and pervasively significant determination that SCE&G engaged in a course of fraudulent conduct, including lying, misleading and failure to disclose material information on project imprudence from regulators at ORS and this Commission. ORS determined that such "fraud" constituted imprudence within the meaning of the amended BLRA, which, for the first time, expressly defined the operative terms of prudence and imprudence as employed in the BLRA. S.C. Code Section 58-33-220. Act 258 (2018).

These definitions are wholly consistent with the long prevailing understanding of the terms in the context of utility regulation and have withstood

the utility's federal court challenge. ORS asserts that the evidence of such fraud and imprudence triggers its determination of the related disallowance of abandoned project cost recovery tied to the date of SCE&G's March 12, 2015, cost overrun and schedule delay filing with the Commission. ORS also notes that SCE&G has obstructed fully responsive production of records in discovery reflective of potentially earlier similar misconduct upon which an earlier disallowance date might be triggered. Indeed, while Friends of the Earth and Sierra Club fully endorse the ORS position regarding SCE&G fraud and imprudence, we assert that such gross misconduct which so impugns the integrity of the entire regulatory system, must bear broader punitive and compensatory consequences.

SCE&G is no longer entitled to any presumption that its imprudence only dates to 2015; or that it only began in 2015 to mislead, withhold material information or lie to its regulators. It hid from regulators what we now know of its misconduct cited by ORS. Why would we not expect that SCE&G has successfully hidden prior records of its deceit? In fact, discovery from SCE&G has indeed produced internal records, cited by other parties, reflecting earlier recognition by senior utility managers of the growing imprudence of continued construction of the project. The ORS fraud determination also compels a broader remedial response

It is essential to assure the fundamental expectations of honesty and transparency by the regulated utility upon which the regulatory system depends. Achieving such assurance depends on a disciplined remedial process to, first,

fully investigate and determine the root cause of the misconduct; second, identify and design a comprehensive corrective action plan sufficient to remedy the full scope ot the misconduct; and finally, monitor and assess the effectiveness of that corrective action plan to remedy the cause of the misconduct. Nothing short of this remedy will assure that the broken regulatory system which allowed this debacle to occur will never happen again.

**4. WHERE SCE&G HAS FAILED TO CARRY ITS BURDEN OF PROOF THAT IT WAS PRUDENT TO DELAY ABANDONMENT OF THE NUCLEAR PROJECT UNTIL JULY 31, 2017, INSTEAD OF TEN YEARS EARLIER, IT CAN NOT RECOVVER THE COSTS OF THE ABANDONED PROJECT.**

The BLRA abandonment provisions imposes the burden on the utility, SCE&G, "of proving by a preponderance of the evidence that the decision to abandon construction of the plant was prudent." S.C Code Section 58-33-280(K). SCE&G insists that no party disputes the prudence of abandonment; but such a glib claim masks the compelling evidence that SCE&G imprudently delayed such decision to abandon the project for many years- extending back to the very inception of the project as Friends of the Earth and Sierra have asserted since 2008. SCE&G appears to concede the legitimacy of this abandonment timing question by offering the historic prudence assessments of its expert, Dr. Lynch, in its effort to prove that abandonment was not warranted by a prudence review at an earlier date. Indeed, the BLRA itself ties a prudence determination to the information available to the utility at the time costs are incurred or to be avoided: "considering the information available to the utility at the time that the

utility could have acted to avoid or minimize the costs." S.C Code Section 58-33-280(K).

ORS, AARP's witness Rubin and Friends of the Earth and Sierra Club's witness Cooper each refute SCE&G's claim that delaying abandonment until July 2017 was prudent. ORS and AARP target different trigger dates earlier than 2017- 2015 and 2014 respectively. Dr. Cooper, reprises his 2012 analysis that abandonment was prudent at that time; thoroughly undermines SCE&G's repeatedly erroneous prudence analyses by Dr. Lynch; and demonstrates that abandonment of the project at the outset based on the information available at that time was the only prudent course.

## 5. WHERE INFORMATION AVAILABLE TO THE UTILITY DEMONSTRATES THAT THE CAPITAL COSTS INCURRED FOR THE ABANDONED PROJECT WERE IMPRUDENT SUCH COSTS MAY NOT BE RECOVERED

Finally, the BLRA abandonment provision requires a second tier prudence determination: first, the prudence of the decision when and if to abandon; and, second, the prudence of the abandoned project costs themselves, "to the extent that the failure by the utility to anticipate or avoid the allegedly imprudent costs, or to minimize the magnitude of the costs, was imprudent considering the information available to the utility at the time that the utility could have acted to avoid or minimize the costs." S.C Code Section 58-33-280(K). The BLRA thus makes all of the project's costs subject to a prudence review, as well as the

prudence of abandonment itself upon the invocation of the BLRA's abandonment provision.

Focused on the measure of "the information available to the utility at the time," both the abandonment decision and the cost incurred must be prudent for cost recovery. Such costs are not immune from a post abandonment review, unless the language of the Act is to be rendered meaningless. No Commission approved project budget could insulate an actual expense from a prudence review; unless the utility is deemed free to squander or misappropriate project funds for illicit purposes. Moreover, any claims of finality for prior Commission budget approvals is expressly conditioned on the status of the project as "constructed or being constructed" pursuant to a Commission scheduling and budget order- conditions not met by the status of this project.

As discussed above, ORS, AARP and we all agree that substantial amounts of project costs should be disallowed as imprudent since incurred after dates when the project should have been abandoned, beyond which all project costs must be deemed imprudent. Each party cites information available, and known, to SCE&G at a time which should have warranted the utility to avoid such project costs by halting the construction and abandoning the project. In our view Dr. Cooper presents the most compelling case that the project was imprudent from the outset given the information available at the time- the prudent decision reached by virtually the entire electric utility industry which abandoned the so-called "nuclear renaissance" before it began. Friends of the Earth and Sierra Club endorse the imprudence evidence and claims presented by ORS and

AARP, while pressing our claims that the preponderance of the evidence warrants complete disallowance of all abandoned project costs as imprudently incurred.

## B. ANY MERGER APPROVAL MUST BE CONDITIONED INORDER TO REMEDY SCE&G MISCONDUCT AND TO PREVENT POTENTIAL RATEPAYER ABUSES

Friends of the Earth and Sierra Club support the proposed Merger Commitments and Conditions, H. Ex 171, proposed by ORS and a number of allied parties, as essential to remedy the misconduct by SCE&G, cited by ORS with respect to fraudulent dealings with its regulators; to prevent potential future abuses to the detriment of ratepayers; and to better assure an energy future founded on efficiency and renewable resources at just and reasonable rates. We endorse the merger condition arguments and evidence presented by ORS, AARP, CCL and SACE; as well as the merger conditions reflected in the proposed Settlement Agreement by the South Carolina Solar Business Alliance with the utilities.

Friends of the Earth and Sierra Club specifically urge the Commission to adopt two of the proposed Merger Commitments and Conditions, H. Ex 171: No. 11. Conditions Regarding Code of Conduct; and No. 13. Conditions Regarding Customer Bill Format.

The ORS fraud determination also compels a broader remedial response to assure that the fundamental expectations of honesty and transparency by the regulated utility upon which the regulatory system depends is assured. Achieving such assurance depends on a disciplined remedial process to, first, fully investigate and determine the root cause of the misconduct; second, identify and design a comprehensive corrective action plan sufficient to remedy the full scope ot the misconduct; and finally, monitor and assess the effectiveness of that corrective action plan to remedy the cause of the misconduct. Nothing short of this remedy will assure that the broken regulatory system which allowed this debacle to occur will never happen again. In addition to such process for corrective action, the utility should be required to adopt and comply with a code of conduct designed to assure full proper disclosure and transparent relations with its regulators, this Commission and the ratepaying public.

In the event that the Commission allows the recovery of any abandoned nuclear project costs, over our objections, we urge the Commission to require the utility to exercise a modest measure of accountability and transparency by explicitly identifying that portion of the customer rate on the customer bill as a separate charge labeled “New Nuclear Cost Recovery Charge,” or “Abandoned Nuclear Cost Recovery Charge.” South Carolina ratepayers are no less entitled to such transparency as are the ratepayers of Georgia Power, in paying for the costs of the Vogtle sister nuclear project. See, Night Hearing Ex. 1.

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## FINDINGS OF FACT

Having observed the witnesses and reviewed the exhibits presented at the hearing and having closely passed upon their credibility, taking into consideration the burden of proof upon the parties, the Commission makes the following findings of fact by a preponderance of the evidence on the whole record:

1. Dr. Mark Cooper testified before the Commission in 2012 in Docket No. 2012-203-E. He holds a Ph.D. from Yale University and has been providing economic and policy analysis for energy and telecom for over thirty years. He has been the Director of Energy and the Director of Research at the Consumer Federation of America for 27 years. He is a Fellow at various universities on specific issues, including the Institute for Energy and the Environment at Vermont Law School. He has testified over 100 times before public utility commissions in 44 jurisdictions in the U.S. and Canada on energy and telecommunications issues and about twice as many times before federal agencies and Congress on a variety of issues, including energy and electricity. In the past few years he has testified on nuclear construction cost issues before regulators and legislators at the federal and state levels in the U.S. and Canada and published papers and articles in professional journals.

2. One of the first public utility commission proceeding Dr. Cooper participated in over a quarter of a century ago involved the prudence and economic viability of the Grand Gulf unit 2 nuclear project. The most recent proceeding involved the same issues with respect to the Turkey Point and Levy reactors in Florida. In the intervening

years he has testified about and published numerous articles on nuclear economics, natural gas, energy efficiency, renewables and electricity restructuring.

More than two dozen academic and trade press articles, testimony and research reports he has authored in the past decade bear directly on his testimony in this proceeding. In 2017 his analysis of the *Political Economy of Electricity* was published by Praeger and in it he developed many of the arguments he made before the Commission in 2012 about the economics of nuclear reactor construction compared to the alternatives. In the past six years he has also published over half a dozen articles in academic and trade publications.

3. In 2017, he published a research report explaining *The Failure of the Nuclear Gamble in South Carolina.* In 2018, he revisited and updated many of the issues he raised in South Carolina in a paper entitled *A Clean Slate for Vogtle, Clean Energy for Georgia*. In that paper, he compared the economics of Vogtle and Summer and explained why South Carolina had done the right thing in pulling the plug on construction of Summer units 2 & 3.

4. The most recent state proceeding he testified in involved a reactor project in Utah. He has also offered testimony on national policies involving these same issues in the U.S. and Australia.

5. In this proceeding Dr. Cooper was asked by Friends of the Earth and Sierra Club to evaluate the appropriate regulatory treatment of costs associated with the abandonment of Summer Units 2 and 3 by South Carolina Electric and Gas Company (SCE&G or the utility) pursuant to the provisions of the South Carolina Baseload Review Act (BLRA) and generally accepted principles of utility regulation. It is important to note

at the outset that he recommended the project be abandoned as imprudent in his 2012 testimony in Docket No. 2012-203-E

6. Dr. Cooper concluded that the utility has failed to act prudently in proposing and executing the construction of the now abandoned Summer Units 2 & 3. Utility imprudence requires the PSC to disallow all costs incurred since the inception of the project. Information was available to the utility prior to the inception of the project which could have allowed the utility to completely avoid incurring all the subsequently incurred imprudent costs. The decision to "abandon construction of the plant" should have been taken at the very beginning and not some ten (10) later when the utility belatedly chose to abandon the failed project. Recently disclosed evidence of chaos in the management of the reactor construction that began from the earliest days of the project as well as the failure to fully inform regulators including the PSC of those known problems provide independent grounds for protecting ratepayers from imprudently incurred project costs.

7. In short, there are four bases to disallow costs, any one of which, alone, would support the finding of imprudence. Combined they present an overwhelming case for disallowance:

Mismanagement of the project,

Misrepresentation of the chaos in the construction process,

Misunderstanding of the economic reality in the electricity sector, and

Misinterpretation of the Baseload Review Act (BRLA).

8. The utility made decisions to support or continue the project at least three times by signing new and modified agreements and subsequently triggering the abandonment provisions of the BLRA on July 31, 2017:

- the EPC in 2008,
- a new agreement in 2012 and immediately asking for recovery of a cost overrun,
- a fixed cost contract and asking for a cost overrun, and

Each time, they issued a brief economic justification. In every case the economic analysis was fatally flawed. There were six, major, repeated errors that ran through the utility analyses:

- The cost of construction was grossly underestimated,
- Natural gas prices were projected to be far above reality,
- Demand growth was projected far beyond real world behavior,
- Efficiency and renewables were never given full consideration as potential resources,
- The company not only assumed a hefty carbon tax (or social cost of carbon) but also assumed that nuclear was the best way to respond to it, and
- Unjustifiable, sunk costs were imposed on the alternatives to boost the case for nuclear.

9. Correcting any one of these errors would have led a prudent decision maker to forego the nuclear project. All six combine to make an overwhelming case for imprudence. Even when the utility decided to abandon the project, it did not recognize these mistakes, it tried to blame the decision on partner Santee Cooper, which had had the good judgement to pull the plug.

10. In his 2012 review Dr. Cooper examined the costs from the narrow perspective of the Base Load Review Act (BLRA) and the broad perspective of public utility regulation. He concluded that from both points of view the proposed cost overruns were not prudent, that continued construction was imprudent and that the project should have been abandoned at that time. He concluded that additional costs should not be recovered from SCE&G ratepayers. If the utility had acted prudently and

taken his advice, it would have avoided billions of dollars of wasted resources. However, in his 2012 testimony, he was asked to assume that project costs approved by the PSC to that date were assumed to be prudent under the BLRA; and that his assessment of the project focused on the prudence of the 'going forward' decision to complete construction versus the prudent alternative of abandonment at that time. Now, however, under the BLRA and accepted regulatory principles the question is more broadly what if any of the abandoned project costs are properly the responsibility of the utility's ratepayers as opposed to the company and its stockholders.

11. Given his 2012 recommendation, it is abundantly clear that all of the costs incurred since that date are imprudent. The recent revelation about the remarkably wasteful and chaotic state of the project even prior to that date and the belated abandonment of the project raise additional considerations that drive the finding of imprudence even farther back in the history of the project. He noted in his 2012 testimony a number of issues that made the decision to begin the project imprudent and the recent evidence of early and continued chaos in the project reinforces the conclusion that the decision to undertake the project was imprudent.

12. In fact, in 2008 Nancy Brockway testified for Friends of the Earth before the PSC in the initial BLRA Combined Application proceeding, Docket No. 2008-196-E. Citing information generally known at the time she urged rejection of the nuclear project as imprudent compared to less costly alternatives. At roughly the same time Dr. Cooper began a series of reports that described the likely causes of the inevitable failure of the so-called "nuclear renaissance" and nuclear reactor construction in the U.S.

13. Recent revelations about the chaotic management of the project from the earliest days of construction confirm and document the validity of the problems in the project identified in his 2012 analysis. Because the timing of what the utility knew or should have known and did or should have done to control costs has become so important and because there is now a very clear disconnect between what the PSC was told along the way and what the reality was, Dr. Cooper began by restating, as appropriate, what he said in 2012 as the basic approach to the analysis; and then updated the analysis in terms of the implications of recent developments showing that these reinforce what he said six years ago.

14. As explained in his 2012 testimony, the constant review of the prudence of projects is exactly what happens in a competitive marketplace. In a competitive market, when a firm finds that a project is no longer economic, it must abandon that project because it will not be able to recover the costs. Firms must make decisions on a forward looking basis, regardless of sunk costs.

15. Emulating the competitive market, the utility should be constantly evaluating the economic prudence of its past investment decisions. The fact that economic analyses conducted by the utility between four and seven years before may have concluded that the Summer 2 and 3 reactors were the least-cost options does not mean they are the least-cost options today. Because market fundamentals have shifted dramatically against the economics of nuclear power, it is now far from the least- cost alternative. The utility should conclude that the project should be halted and the future needs of SCE&G ratepayers should be met with lower-cost alternatives.

16. Because electric utility service has long been viewed as a natural monopoly, it has been delivered to consumers in areas where utilities are given franchises as the monopoly service provider. The rates, terms and conditions of service are regulated, as are many of the investment decisions, since the delivery of service to consumers is not a competitive activity. Since there is a monopoly provider, consumers must be protected from the natural tendency of service providers to charge whatever the market will bear or provide poor service. Thus, public utility ratemaking is fundamentally consumer protection and it is constructed to give consumers the same protections that a competitive market would. In order to understand how advanced cost recovery affects the process of consumer protection it is necessary to review several of the key principles of consumer protection that guide public utility commissions.

17. In traditional utility rate making, the utility makes all the investment in the plant necessary to bring it on line with shareholder resources. When the plant is ready to go on line, the utility seeks to put it into rate base. Only when the plant is ready to deliver electricity is it considered to be “used and useful” to the captive customers of the utility. In a general rate case, the utility will seek to charge ratepayer for the sum it has invested in the plant, as well as recover the operating (variable) costs of generating power. The sum invested is also allowed to earn a return on capital during the construction phase, which is typically entered into a separate account (allowance for funds used during construction, AFUDC). The rates charged to consumers also include depreciation of the plant as it is produces electricity, which returns the capital investment to the utility. Thus, the utility gets a return of and on its capital while the plant is operating.

18. This "used and useful" principle is embodied in the BLRA itself where the statute recognizes, but limits, the advance cost recovery to circumstances where the utility is actively constructing the plant in accordance with the construction budget and schedule approved by the Commission:

> (C) So long as the plant is constructed or being constructed in accordance with the approved schedules, estimates, and projections set forth in Section 58-33-270(B)(1) and 58-33-270(B)(2), as adjusted by the inflation indices set forth in Section 58-33-270(B)(5), the utility must be allowed to recover its capital costs related to the plant through revised rate filings or general rate proceedings.
>
> S.C. Code Section 58-33-275(C).

The corollary to this BLRA bargain is presented here by the utility's abandonment of the project: it no longer is entitled to assured cost recovery for a useless and failed investment.

19. The task of public utility commissions is generally to ensure that the utility delivers the least-cost power, subject to the need for reliability (and other) considerations, since that would be the outcome in the marketplace. Competition drives the least-cost, most efficient technology to the consumer. Emulating a competitive market, the public utility commission will consider whether the costs the utility seeks to recover from ratepayers are 'just, reasonable and prudent.' The commission oversees the decision about which technologies to use and which costs utilities are allowed to recover. Even where the construction of new facilities takes place within the parameters of an Integrated Resource Plan, which is a long-term energy plan, the fact that the utility has been told or allowed to build a certain type of plant does not alter the fact that the costs cannot be recovered from ratepayers until the plant is used and

useful and the cost (including the return on investment) are found to be just, reasonable and prudent.

20. These two principles of utility regulation protect consumers from different potential abuses. Used and useful ensures that ratepayers receive service in exchange for the recovery of costs, while just, reasonable and prudent ensure that the costs recovered are not excessive. If projects are cancelled or abandoned they do not become used and useful and their costs would not normally be recovered in the marketplace (except if all sellers suffer similar problems, in which case all sellers in the market will put their prices up to cover the costs). However, utilities may recover the costs associated with abandoned projects, if they can show that the decision to commence the project was prudent and the causes of the termination of the project were not imprudence on the part of the utility.

21. This pattern of cost recovery reflects what would happen in a competitive market, which is why it is used as a ratemaking standard. When a product is sold to the consumer, the consumer has the immediate use of the product and the price includes only a normal return on investment (if the market is competitive). Suppliers who are inefficient and have costs above the market price or who try to earn supra normal profits by setting prices above costs, will not be able to recover those excessive costs from consumers. Consumers would not purchase the overpriced products because they would have lower cost options in the market place. The supplier's inefficiency will come out of the supplier's pocket in the form of a lower rate of return earned on the investment. These principles balance the interest of utility stockholders, who receive a fair rate of return, and ratepayers, who receive useful products at reasonable prices.

22. When he observed in 2012 that advanced cost recovery under the BLRA distorted the utility's incentives in an inefficient and costly manner favoring expensive and risky nuclear technology, Dr. Cooper hardly expected the disastrous result confronting ratepayers, regulators and the utility today. Despite his characterization of the perverse potential for cost recovery in the event of project cancellation, traditional regulatory principles, as well as the specific abandonment provisions of the BLRA, impose a disciplined prudence review of both the abandonment decision and the project costs incurred.

23. The BLRA itself failed to provide any definitions of the terms "prudence" or "imprudence," despite those terms' central operative role in Commission approval of baseload projects, in its review and approval of project cost overruns and, finally, as here, in reviewing and disallowing costs incurred upon project abandonment. The South Carolina General Assembly recently remedied these omissions by an amendment to the BLRA clarifying the definition of these critical terms:

> SECTION 1. Section 58-33-220 of the 1976 Code is amended by adding appropriately numbered items to read:
>
> "( ) 'Imprudent' or 'imprudence' includes, but is not limited to, lack of caution, care, or diligence as determined by the commission in regard to any action or decision taken by the utility or one acting on its behalf including, but not limited to, its officers, board, agents, employees, contractors, subcontractors, consultants affecting the project, or any other person acting on behalf of or for the utility affecting the project. Imprudent or imprudence includes, but does not require, a finding of negligence, carelessness, or recklessness.
> Imprudence on behalf of any contractor, subcontractor, agent, or person hired to construct a plant or perform any action or service on behalf of the utility shall be attributed to the utility.
>
> ( ) 'Prudent', 'prudence', or 'prudency' means a high standard of caution, care, and diligence in regard to any action or decision taken by the utility or one acting on its behalf including, but not limited to, its officers, board,

agents, employees, contractors, subcontractors, consultants affecting the project, or any other person acting on behalf of or for the utility affecting the project.

To the extent a utility enters a contract with a third party that delegates some or all decision-making authority related to the project, the utility retains the burden of establishing the prudency of specific items of cost or specific third-party decisions.

'Prudent', 'prudence', or 'prudency' also requires that any action or decision be made in a timely manner.

In determining whether any action or decision was prudent, the commission shall consider, including, but not limited to:

(a) whether the utility acts in a timely manner, with any passage of time which results in increased costs or expense prior to the utility acting or making the decision weighing against a finding of prudency;

(b) whether prior actions or decisions by the utility were imprudent and such imprudent actions led to a decision by the utility that could otherwise be prudent. Such circumstances weigh against a finding of prudency; and

(c) any other relevant factors, including commission of a fraudulent act, which are deemed not to be prudent.

As used in item (c), 'fraud' includes, in addition to its normal legal connotation, concealment, omission, misrepresentation, or nondisclosure of a material fact in any proceeding or filing before the commission or Office of Regulatory Staff. Proceedings and filings to which the provisions of this paragraph apply include, but are not limited to, rate or revised rate filings, responsive filings, motions, pleadings, briefs, memoranda, document requests, and other communications before the commission or Office of Regulatory Staff."

Act 258, effective June 28, 2018.

24. In Dr. Cooper's opinion these recently adopted statutory definitions of prudence and imprudence are wholly consistent with the generally accepted understanding and use of those terms by experts in the field of utility regulation as well as by regulators as applied to the review and regulatory treatment of costs associated

with the construction of new utility generating facilities. The concept of utility prudence is generally understood to impose a "high standard of caution, care, and diligence" in the management of a complex project, including the utility's supervision and oversight of its contractors engaged in the engineering and construction of a project. Imprudence, by contrast, is generally understood as a "lack of caution, care, or diligence," by a utility. It is also generally understood that the utility has a duty of honesty, and disclosure to regulators, including ORS and the Commission, of material facts regarding the project, to exclude as imprudent acts of fraud, including "concealment, omission, misrepresentation, or nondisclosure of a material fact." None of the elements of the recently clarified definitions of prudence and imprudence depart from the generally accepted use of those terms in the field of utility regulation.

25. Moreover the utility itself has endorsed these principles in defining the same terms, prudence and imprudence, in the context of reviewing costs incurred in the construction of a nuclear generating facility. In the judicial review of the Commission's 2012 cost overrun case, all parties agreed that the opinion of the Georgia appeals court set forth the accepted definition of the terms, ironically, in the context of reviewing cost overruns in the 1980's construction of the first Unit 1 at the Plant Vogtle nuclear generating station.

The prudency standard was further defined by the PSC:

> The standard by which management action is to be judged is that of reasonableness under the circumstances, given what was known or should have been known at the time the decision was made or the action was taken. The concept of prudence implies a standard or duty of care owed to others. In building a nuclear power plant, the Nuclear Regulatory Commission requires the utility to exercise a high standard of care in order to protect the public health and safety. Similarly, given the costs involved and the rate impact of those costs on monopoly

> customers, this commission finds that the utility should be held to a high standard of care in making decisions and taking actions in its planning and constructing such a project. Thus, while the standard to be applied is reasonableness under the circumstances, where the risk of harm to the public and ratepayer is greater, the standard of care expected from the reasonable person is higher. Given this standard ..., a reasonable person is one who is qualified by education, training and experience to make the decision or take the action, using information available and applying logical reasoning processes.
>
> Georgia Power Co. v. Georgia Public Service Comm'n, 196 Ga. App. 572, 396 S.E.2d 562 (1990).

26. Thus, the imposition of a "high standard of care" on utility management in the "planning and construction" of a nuclear power plant is beyond dispute. The fact that ratepayers are the captives of a monopoly in which the utility is the driving force, places the burden on the utility. This is particularly the case in disputes between the utility and vendors. Under certain circumstances, according to this ruling, the captive status of customers might even make it possible to not allow the recovery of prudently incurred costs.

27. To the extent that prudence review applies under the BLRA, the principles are clear. The BLRA legislation created a piecemeal process that gave the utility more assurance about early cost recovery, but did not abandon the overarching principles of prudence review for evaluating expenditures that were made in the delivery of an operating reactor. For projects that were abandoned, this traditional view of prudence was even more evident, as discussed below.

28. While the BLRA represented a dramatic change in the way rates are set for new nuclear reactors built in South Carolina, it did not abandon the fundamental concepts of just, reasonable and prudent that govern the setting of rates. Advanced

cost recovery under the BLRA gives nuclear costs very special treatment, but it is not a blank check and it does not diminish the obligation of the utility to ensure that it delivers the least-cost electricity to ratepayers.

29. The 2012 cost overrun proceeding signaled to the commission that the utility had failed to continue to practice the cost vigilance it is obligated to exercise. When the contingency cost pool that the utility proposed in the initial BLRA proceeding was rejected by the South Carolina Supreme Court, the utility quickly updated its cost estimate. It took a second bite at the apple and chose to increase its cost estimate by $174 million to establish a cost basis of $4.3 billion.

30. A mere two years later, it was back asking for another $283 million, a cost increase of 6.6 percent. With this request, the cost overruns have now driven the total cost of the project above the original cost estimate plus the contingency cost pool. The BLRA required a prudence review of the increase in costs and that was the moment for a thorough review of the cost and economic viability of the project.

31. Since his 2012 testimony the rate of project cost-overrun 'bleeding,' driven by the utility's and its vendors' imprudence, has only accelerated. The Commission approved $131.6 million in cost overruns after the 2012 proceeding. In 2015 the cost overruns reached $698.2 million; and in 2016, when the project's terminally imprudent status was yet more evident to the utility, it procured a Commission approval for a staggering construction budget increase of $831.3 million, premised on the foolish claim that pouring millions of additional dollars into Westinghouse's near-bankrupt coffers would remedy the project's mortal wounds. The questions of what utility management knew of the project's imprudence and when they knew it; as well as the significance of

material information withheld from regulators was hotly litigated in this proceeding. Dr. Cooper's testimony here, however, rests primarily on the analysis he conducted in 2012, arguing for the imprudence of going forward with the project, merely extended back to the point of the project's inception. Emerging evidence of internal utility awareness of imprudence confirms his analysis and supplies additional bases for providing relief for ratepayers.

32. Dr. Cooper shows in his testimony that there are numerous ways in which the costs the utility now seeks to recover from ratepayers should have been anticipated in the original cost estimate, but were not; or have been caused by actions of the utility or its vendors. Ratepayers should not be forced to bear the burden of these actions. In addition, there is an even more fundamental reason that these costs should not be recovered from ratepayers – the overall project was no longer prudent. Although the BLRA gave nuclear reactor construction special treatment in the cost review process, it did not alter the underlying principles that allow recovery of only just, reasonable and prudent costs. The obligation that a project be prudent is continuous, not a one-shot determination. When economic conditions change projects that have become economically unattractive should be abandoned.

33. On the one hand, the BLRA gave strong incentives for the utility to choose to build nuclear reactors to meet the future need for electricity. The statute gave a utility investing a new nuclear reactor a remarkably good deal: advanced cost recovery, no challenge of individual cost elements as imprudent, guaranteed cost recovery as long as the utility adhered to the construction schedule and cost estimates, flexible scheduling contingencies, an automatic rate of inflation; the choice of advanced cost

recovery or normal utility cost recovery; the full commission approved rate of return, even though substantial risk had been transferred to ratepayers through all of the above mechanisms; and allocation of recovery of costs of a base load facility according to peak load demand.

34. On the other hand, the BLRA did not alter the definitions of just, reasonable and prudent. The initial decision to build a reactor with advanced cost recovery is subject to the traditional principles that require the costs associated with the project to be just, reasonable and prudent, even though that decision was before the reactor became used and useful. The BLRA required cost increases above the initial level approved to also be subject to full prudence review.

35. The suspension of the used and useful standard for these specific investments introduces distortions into utility decision making that highlight the importance of the just, reasonable and prudent principles for ratemaking. Dr. Cooper only suggests that the commission rigorously apply the existing standards when it has the opportunity to do so. The BLRA review of cost overruns is an important opportunity.

36. Having opened the door to a prudence review by seeking to recover cost overruns from ratepayers in 2012, Dr. Cooper believes the underlying statute also requires that the cost overrun be considered in the broader context of the overall project. Prior to abandonment he was not suggesting that the commission look back to disallow any costs that have already been deemed prudent by the initial ruling, but to ask whether further costs should be incurred. Prior to abandonment the statue allows all costs that have been approved to be recovered, but that does not stop the utility for deciding not to incur additional costs, if the project is no longer the least-cost alternative,

nor does it preclude the Commission from examining the new, higher cost of the total project as part of its prudence review of the incremental cost overruns.

37. Under the BLRA, prior to abandonment, costs that have been incurred must be recovered by the utility, but if the future costs are no longer prudent, the utility should say so, and the Commission should find as much. The utility should be required to do the proper economic analysis in this and every proceeding in which it seeks to recover costs in excess of the original estimate.

38. Because the BLRA has guaranteed the recovery of previous costs incurred, the relative costs of future alternatives requires SCE&G and the Commission to compare the total cost of the nuclear project to the costs of alternatives, plus the costs that have been sunk into the nuclear reactor. This approach to project review (modified by the special treatment of sunk nuclear costs) rests on the fundamental economics of market behavior, which provides the basis for the broad principles of utility regulation.

39. The above discussion shows the continuing importance of prudence review and the fact that the PSC must make piecemeal decisions about the recovery of costs prior to the project being used and useful magnifies the importance of prudence review. In a sense, the piecemeal recovery of costs places greater emphasis on the decision making along the way. Here is where the failure of the utility to reflect the utter chaos in and mismanagement of the project takes on special importance. We now know that the "happy face" the utility showed to the PSC and the public was a façade put on for the early "piecemeal" cost overrun approval process that must now be revisited since the project has been abandoned and can never be "used and useful" in providing utility service.

40. The BLRA made two very important changes to traditional regulation, but not the one the utility seems to think it did. It established piecemeal prudence review, which allows the utility to recover costs before the overall project is used and useful. The approval of budget estimates and schedules that would trigger cost recovery is important, but the expenditures were not guaranteed; they are still subject to prudence review. Almost from the outset, the utility never adhered to the cost estimate or the delivery schedule. That alone put the "guaranteed" cost recovery under the statute into doubt. The failure of the utility to fully inform the PSC of the extent of chaos and mismanagement, from the earliest days of construction, cast even greater doubt on the "guarantee" the utility mistakenly thought it had.

41. It is important to note here that the 2012 testimony took the past cost recovery decisions as given and showed that continuing to spend money on the project was imprudent. While the principles remain constant, the change in conditions, revelation of utility failure to disclose important facts and conditions and the abandonment of the project, shift the focus. We now have evidence that the past expenditures themselves were imprudently managed and executed, which opens the door to much closer scrutiny, as does the abandonment decision.

42. When Dr. Cooper analyzed the allocation of risk in the initial cost overruns he made clear the distinction between authorizing expenditures first, but requiring a prudence review second , as was his conclusion that the utility was attempting, erroneously and unfairly, to shield stockholders from any of the burden of cost overruns. He put it as follows (2012 Direct, pp. 20-21):

"The company has shouldered none of the risks. The company points out that it negotiated the vendors claim for additional costs down. Compared to the costs that the utility has asked ratepayers to cover, the utility has asked for ratepayers to pick up six-sevenths of the total cost overruns. The utility has shouldered none of the costs.

| | Change Orders | Owner | Transmission Cost | Total |
|---|---|---|---|---|
| Vendor | $76 | 0 | 0 | 76 |
| Ratepayers | $144 | 276 | 21 | 441 |
| Owner | $0 | 0 | 0 | 0 |

Allocation of risk (Marsh, p.19)

Producers are likely to bear some or all of the risk of cost overruns in competitive markets, unless all of the competitors make the same decisions and none pursues a lower cost approach, which is highly unlikely. Given that the utility is guaranteed a full rate of return in advance, allowing it to avoid any share of the cost overruns insulates it from the risks that ratepayers and even the vendors are bearing.

43. Coming at the moment of the first major cost overruns and showing that the utility was going to protect its stockholders at all costs, while shifting the burden primarily onto ratepayers, the 2012 case was a key moment to reject the prudence of cost overruns. It turns out that the heart of the project had fallen into disarray, but the direness of the problem was never conveyed to the PSC. We now have a solid account of how bad things were in the press, which was later corroborated by "official" documents, and from which the project never recovered. This was the moment that the project should have been abandoned.

44. The problems in the early days of the project were described in a November 1, 2017 article in Engineering News-Record entitled "Witness to the Origins of a Huge Nuclear Construction Flop." The article reports the perspective of a senior manager of nuclear procurement quality assurance, who ended up at Bechtel after his difficult period on the project. Looking at the Westinghouse bankruptcy, it reached a dramatic conclusion about "the traumatic infancy of a slow-developing disaster" and its impact on the "nuclear renaissance.

> If historians examine why the nuclear renaissance fizzled, they could cite Westinghouse's promise that AP1000 reactors needed "a short, 36-month construction schedule" from first concrete to core load. Or they could note that Shaw was unprepared for what it faced from its partner Westinghouse and the nuclear construction industry. The glittering promise that modular design would erase much of the risk of nuclear construction turned out to be just that, a glittering promise. The V.C. Summer and Plant Vogtle projects, instead of forming the basis of a nuclear renaissance, delivered a body blow to U.S. nuclear construction as devastating as any of the disastrous nuclear projects that are already in the history books.

45. Ironically, this observation on the "flop" of the so-called "nuclear renaissance" bears a striking resemblance to an article in *Forbes* magazine publish just over three decades earlier. With the word "Fiasco" emblazoned on the cover of a February 1985 edition, *Forbes* magazine painted an eye-catching picture of the failure of nuclear power, in America:

> The failure of the U.S. nuclear power program ranks as the largest managerial disaster in business history, a disaster on a monumental scale. The utility industry has already invested $125 billion in nuclear power, with an additional $140 billion to come before the decade is out, and only the blind, or the biased, can now think that most of the money has been well spent. It is a defeat for the U.S. consumer and for the competitiveness of U.S. industry, for the utilities that undertook the program and for the private enterprise system that made it possible.

History had repeated itself. In fact, in America this history of failure is the only history that nuclear reactor construction had and this was the moment to escape from a repetition of the mistakes of the past that would inevitably cost ratepayer tens of billions of dollars.

46. The recent article outlined a dramatic failure at the core of what was supposed to be a new approach to standardization and modularization of components that was supposed to reduce construction times dramatically. Of equal, if not greater, importance, for the analysis of imprudence, it revealed two key facts that call into question prior findings of prudence. First, it appears that the severe problems were never fully conveyed to the Commission. Second, there was a concerted effort to gloss over the severity of the problems. The official documents exchanged between the vendor and the utility reflected much more severe problems than the official statement given to the public and the PSC. As the article noted:

> Even after Hartz's team had stopped work at Lake Charles in 2010 and the NRC had sought to clamp down on what it saw as Shaw's lax quality control in its design-change process with Westinghouse, Westinghouse and the utilities reported optimistically about progress at the two projects. For example, at an American Society of Mechanical Engineers seminar in June 2011, Westinghouse's module fabrication manager presented a slide show that lauded all the design's benefits but made no mention of the developing problems. The seminar was titled "Blueprint for a Nuclear Renaissance.

47. We have already noted the pressure to put on a happy face in the exchange of letters between SCE&G and Westinghouse four year later, so there is a pattern that may well deserve to be described as a cover-up. But that is not the worst of it. With evidence of "pressure" to put on a happy face, in spite of the huge problems coming from the vendor, in 2010 to 2014, to which the utility apparently agreed, and the striking

evidence of pressure coming from the utility to tone down or eliminate criticism from its own auditor (i.e. scrubbing the Bechtel report), we see a clear and consistent pattern of willful misreporting, nothing short of a cover up.

48. This material identified well over a dozen issues that were later corroborated in confidential letters and audits of the project:

- A rush to start in the face of a steep learning curve in pursuit of "an airy fantasy,"
- Lack of personnel and upheaval in senior management,
- Lack of a final design,
- Lack of quality control,
- Laborious change management process due to lack of onsite authority,
- Toxic relations between members of the construction consortium,
- Failure of the module production process,
- An angry, hostile reaction from the vendor, rather than acceptance of responsibility,
- Pressure to approve production and downplay problems,
- Downplaying importance of rules and qualifications,
- Failure to inform the NRC,
- Cancellation of NRC inspection due to chaos at the site,
- Failure of NRC inspection,
- NRC failure to provide close regulatory oversight, and
- Shutdown of the fabrication, missed deadlines for delivery and project delay.

H. Ex. 11,MNC-3 provides the citations for these problems as well as corroboration in official documents that were later revealed.

49. It is one thing to name risks as the utility did in its initial application; but quite another to assess their probabilities and respond to them when things go bad. The utility underestimated some risks at the outset by failing to acknowledge the history of nuclear power and the challenge of building a first-of-a-kind plant. It mischaracterized others and never responded to any of the risks in a prudent manner.

50. The complaint about the misestimation of risk is deeply embedded in the project. In 2008, Nancy Brockway testified before the PSC in the initial Combined Application proceeding Docket No. 2008-196-E. At roughly the same time Dr. Cooper began a series of reports that described the likely causes of the inevitable failure of the so-called "nuclear renaissance" and nuclear reactor construction in the U.S. In his 2012 testimony he pointed out several ways in which the utility had misrepresented and misunderstood risk. The concerns raised by that first Friends of the Earth witness are similar the concerns he raised in 2012 and they remain at the center of the review of imprudent and abandonment costs. The company emphasizes that it identified a long list of such risks. Having the list is one thing, responding to it is quite another.

51. If we review the list of risk factors that the utility identified in its application, provided in H. Ex. 11, MNC-4, we find a number of key risks that the utility failed to deal with. The observations are organized according to the six categories of risk used to evaluate nuclear reactor construction. Several things are striking in Exhibit MNC-4. First, every one of the risks that were under the control of the utility to some extent went wrong. The only two categories that did not go wrong were weather/extremist events, which were not present and the inability to operate the plant, which was never put to the test. One can argue that regulatory risk was minor in the sense that the regulator was supportive, but the company's behavior was so incompetent that even a friendly regulator had to take actions to maintain its credibility.

Second, the list includes only factors associated with the construction and operation of the reactors. All of the risks that were purportedly under the control of the utility: engineering, procurement, construction, even financing (evidenced by the need to

raise increasing sums of money over which it is now being sued) went very wrong and the utility never got a handle on any of them.

Third, a list of possible things that could go wrong from the point of view of utility management is one thing, but for all of them to go wrong at the same time and none of them to be significantly corrected, is quite another. It is imprudent in the extreme to push ahead with a project that is going so badly on every front.

Fourth, it ignores other risks, like marketplace risk, technology risk and policy risk. These, too, must be part of the decision-making process. In a competitive market, the fact that a firm can produce something at a given cost is only half the battle. It has to be able to sell the product when confronted by conditions in the market (marketplace risk) and the actions of its competitors (technology risk), within the terrain that policy (risk) sets for the market.

52. It turns out that not only did every bet the company made against these risks go bad, but they went bad much sooner and much bigger than the information provided by the company to the PSC indicated. Moreover, it became clear quickly that the utility had seriously underestimated the execution risk, as the dispute between Westinghouse and the utility suggests.

53. As the project went bad and the utility began to complain, Westinghouse reminded the utility that it was undertaking a "first-of-a-kind" project and risks would be severe. A Charleston Post and Courier article reported on March 5, 2018 that "SCANA and Santee Cooper knew what they signed up for when they agreed to pay for the first-of-a-kind reactors…The two utilities knew that Westinghouse did not have a finished design when they inked a deal in 2008…They understood Westinghouse was finishing

the design when construction began in 2012. Everyone understood…that a large number of engineering changes might be "a normal part of the construction process"…But Westinghouse had a request: The companies needed to keep the fight out of public view. If they didn't, it would have a 'decidedly negative effect on everyone involved in the project…'" Therefore, the utility "had to go along" with the associated cost overruns. The article goes on to state:

> The newly released communications highlight the high level of angst just months into the lengthy project…The problems that plagued the reactor from the start led to Westinghouse going bankrupt and doomed the $9 billion project….
> While the utilities privately bickered with the contractor, customers paid more than $2 billion for reactors that will never churn a kilowatt of electricity.
> SCANA's executives had earlier assured Wall Street investors that the project wasn't suffering from spiraling schedules and inflated budgets like past nuclear construction.

54. None of this was relayed to the PSC with anything near the reality that was taking place behind the scenes. Indeed, rather than acknowledge the severe potential problems of "first-of-a-kind" project, SCE&G was inclined to depict being first as an advantage in a number of ways.

> The risk factors related to the Facilities fall into several broad categories. Certain of the risk factors are risks that are typical of construction projects of the size and complexity of the Facilities. Others are related to the degree and sensitivity of the regulatory and safety oversight that are involved in nuclear construction. Still others are related to the fact that the Units will be among the first new nuclear units sited and built in the United States since the 1970s and 1980s, and will be among the first of what are anticipated to be a dozen or more new Westinghouse AP1000 units to be constructed in the United States and other countries over the next decade.
>
> In addition, because the Units will be among the first Westinghouse AP1000 units anticipated to be constructed in the United States, suppliers, contractors and others in the industry are expected to have a strong interest in supporting the success of SCE&G's construction and permitting process.

> The Units are also likely to be among the first of a dozen or more new Westinghouse AP1000 units to be built in the United States. The supply chain for nuclear-grade plant components has not been supported by new construction for some decades and will need to be significantly expanded to meet the requirements of this new construction cycle.
>
> In this context, it is helpful that Units will be built at the leading edge of the cycle, and should have the first call on the suppliers and manufacturing capacity that exist today. Nonetheless, the volume of anticipated nuclear construction around the world may create shortages in this capacity which may lead to increased costs and schedule delays in obtaining key components.
>
> As one of the first nuclear construction projects anticipated to get underway in the current construction cycle, the SCE&G construction project should have an advantage in attracting the required personnel over projects beginning later.

Exhibit J: Risk Factors Related to Construction and Operation of the Facility, Docket No. 2008-196-E. The contingency fund had failed to cover the bets, the misuse of the escalation savings had failed to cover the bets and the company had every reason to expect things to get worse and worse. Continuing the project under these circumstances was blatantly imprudent and failing to fully inform the PSC was consciously misleading. Whether it was as bad and nefarious as to constitute punishable fraud will be decided by various courts. That it constituted imprudence, established at a much lower measure of proof is certain.

55. This list is only part of the story. There were other areas where it can be argued that the utility had less control, for example: technology, marketplace and policy. The fact that it had less control is not an excuse to ignore these risks because the utility must respond to them. Every one of the assumptions it used to justify construction of the reactors proved wrong, long before construction began, undermining even the pretense that nuclear power was economic.

56. The failure of the utility to list these other risks is indicative of a fundamental flaw in its approach to management and prudence review. Under market conditions management must take market, technology and policy risks into account. The ability to produce a good or service at a given cost is only half the challenge. There must also be demand for it, including the question of what the cost (and price) of similar products from other producers would be.

57. Things grew worse and worse over time, but the utility continued to make erroneous assumptions in an attempt to demonstrate that the project made economic sense for consumers.

58. From the very beginning the utility exhibited a baseload bias that blinded it to the possibility that alternatives could provide lower cost power. Friends of the Earth complained about this bias in the initial proceeding, as did Dr. Cooper in his 2012 testimony. The utility continued to make this tragic mistake right up until the end. Prudent management cannot look at the world the way it wants to, it has to analyze the world as it is. Try as it might, its fake analysis could not make the reality go away. So, the utility looked at gas as the only alternative it would consider and it did it did not do a very good job of projecting gas prices. Before construction ramped up, the price of gas had fallen by almost two thirds and it has never shown any tendency to increase to the levels that the company had assumed to justify the project. Starting in 2010, even using the utility's baseload bias, the project was not prudent.

59. A second major marketplace risk that the utility ignored was the dramatic decline in demand growth. Not only was there no need within its system for this

capacity, but since the reduction in demand growth was pervasive throughout the industry, there was little if any chance it could find customers for it overpriced power.

60. With high costs on the supply-side and no need on the demand side, the only way to keep the project going was to hide the truth, which is exactly that the recent evidence suggests the company did. The utility offered two policies that they thought would help the case of nuclear reactor construction. Both fail miserably.

One of the most frequent claims put forward to justify the subsidization of nuclear reactors (old and new) is the claim that they are essential for decarbonization of the electricity sector. As is the case for all things nuclear, they are a brutally inefficient way to achieve that goal. New reactor construction is particularly inefficient at decarbonization because it takes so long. While nuclear reactors are bogged down in the construction phase, alternatives could be online meeting the need for electricity with carbon free resources. Between the carbon-intensive construction process and the long construction period, one quarter of the advantage of nuclear *vis-à-vis* coal is squandered. Moreover, nuclear reactors are so large that it makes managing the retirement schedule more difficult. It is also important to note that nuclear power is not an attractive resource when other pollutants are considered.

61. The utility claimed that nuclear would diversify the resource mix away from natural gas. That benefit was entirely a function of the baseload bias and the assumption of unrealistic demand growth. The benefit of diversity is to improve resilience, but huge nuclear units create severe vulnerability to outages. They increase the need for very large reserve margins and large units. The better approach to diversity it to include many smaller units spread across a wide geographic area.

H. Ex. 11, MNC-5 highlights the fact that many of these issues were raised in the initial testimony on behalf of FoE in 2008. This difference in estimation of risk is not a "matter of opinion," but the difference between prudent and imprudent decision making in a situation that holds the utility to a high standard of prudence.

62. In some ways abandonment of the project changes the analysis of imprudence and in others it does not. On the one hand, it does not alter the fundamental principles of prudence review. Imprudently incurred costs should not be recovered from ratepayers whether or not the project is completed. On the other hand, abandonment means that the project will not be used and useful. From the ratepayer point of view, it is pure waste. This raises basic questions and heightens scrutiny. When should the utility have realized that the project would fail and how much was wasted after the ultimate failure could be predicted?

63. Moreover, abandonment has always altered the way sunk, but wasted costs are recovered, since the project can never be used and useful to provide any benefits to ratepayers. Therefore, the reward enjoyed by stockholders is also reexamined.

64. Under normal conditions of market competition, the utilities would recover few of the resources they wasted. Under the normal circumstances of utility regulation, there is no doubt that regulators would give close scrutiny to wasted resources and could prevent imprudent costs from being imposed on ratepayers. They could also limit the burden of the recovery of sunk and abandonment costs by lowering the utility's rate of return and shortening the recovery period. The disallowance and reduced earnings are justified because the competitive market, which utility regulation seeks to emulate, does not generally reward failure. While the utility argues that the BLRA perversely

assures cost recovery from ratepayers even in the event of project abandonment; the terms of BLRA expressly retain the traditional prudence determinations for the recovery of abandoned project costs.

65. Abandonment would also open the possibility of other means for reducing the burden of sunk costs: of "claw backs" of costs that had been imprudently incurred. It would be possible to reduce the amount of sunk costs for which ratepayers are on the hook. These "claw backs" include reclamation of costs under the bankruptcy laws, capture of the Toshiba parental guarantee for ratepayers, reviewing significant costs approved in the face of imminent abandonment, and revisiting the decision to allow the cost overruns in the first place, given the subsequent evidence of poor analysis, management or utility misconduct.

66. The agreement reached in late 2016 to handsomely compensate the errant vendor, Westinghouse, to accept a so-called 'fixed-price' contract is now highly suspect. The vendor was asked for a new work plan and schedule, but failed to deliver one. These costs could be disallowed by the Commission. As of mid-2017, SCE&G had paid Westinghouse about $1.7 billion out of $4.9 billion of construction costs that had been incurred. Thus, there appears to be a large sum of "sunk" costs that have not been paid yet. Given the complete breakdown of project management and the failure to have a realistic plan of operation, the entire increase in sunk costs back to 2008 should be examined.

67. The suggestion that ratepayers are better off because they paid less for a useless and wasteful project is ironic, to say the least, but technically, the financing arrangement lowered the cost of capital the utility paid. However, I have always been

skeptical of this argument for two reasons. First, without the shifting of risk to ratepayers with advanced cost recovery, utilities might have been less inclined to undertake wasteful projects. Second, the financial calculation ignores the opportunity cost of consumer capital. Having ratepayers pay earlier robs them of the use of their money. The cost/benefit calculus is more complicated than the simplistic approach taken by the utility. At the end of the day, the abandonment negates any discussion of benefits. The total amount charged to ratepayers is what matters.

68. The plain language of the BLRA statute suggests that abandonment still triggers a traditional broad review of prudence. The language is as follows:

> SECTION 58-33-280. Requests for approval of revised rates.
>
> (K) Where a plant is abandoned after a base load review order approving rate recovery has been issued, the capital costs and AFUDC related to the plant shall nonetheless be recoverable under this article provided that the utility shall bear the burden of proving by a preponderance of the evidence that the decision to abandon construction of the plant was prudent. Without limiting the effect of Section 58-33-275(A), recovery of capital costs and the utility's cost of capital associated with them may be disallowed only to the extent that the failure by the utility to anticipate or avoid the allegedly imprudent costs, or to minimize the magnitude of the costs, was imprudent considering the information available at the time that the utility could have acted to avoid or minimize the costs. The commission shall order the amortization and recovery through rates of the investment in the abandoned plant as part of an order adjusting rates under this article.

Abandonment is dealt with in a separate section that clearly distinguishes the abandonment rate proceeding from other, prior, proceedings under the BLRA. Abandonment has several aspects.

First, the utility must demonstrate that the abandonment is, itself, prudent. Abandonment was obviously the right thing to do; but at the grossly wrong time - almost ten (10) years too late.

Second, independent of prior ratemaking, the PSC is charged with the obligation to assure that ratepayers are charged only costs that have not been imprudently incurred. Moreover, failure to avoid or minimize the costs that are to be recovered from ratepayers can lead to a disallowance.

Third, to the extent that recovery of abandoned cost is allowed, the PSC sets the amortization period for the investment in the plant. The term “the investment” without qualification certainly suggests that all investment is to be put under review.

Thus, traditional prudence review applies at two points in the overall process. It constitutes the second step in the prudence process in which the PSC engages in an examination of costs for plants that are (or will be) used and useful. It also constitutes a separate proceeding in the event of abandonment.

69. The utility received a number of incentives to undertake the project, including piecemeal review and other positive incentives, but this plain language of the statute did not excuse it from traditional prudence review at key points.

First, the 2012 date for abandonment that Dr. Cooper advocated would have dramatically reduced the costs that had been sunk in the project. Emerging undisclosed evidence of imprudence and utility misconduct support additional ‘claw backs’ of imprudently incurred project costs. The difficulties of achieving on-budget and on-schedule construction became apparent in 2010, during the early ramp up. For

example, SCE&G's CEO Kevin Marsh chastised Westinghouse management in 2013 that it was

> now in its third year of unsuccessful attempts to resolve its (module) manufacturing problems at the (Lake Charles) facility which continue to impact our project negatively. Your missed deadlines put potentially unrecoverable stress on the milestone schedule approved by the SC Public Service Commission. I don't have to remind you that continuing delays and cost overruns are unacceptable from a public perspective and could have serious effects.

Indeed. The utility's non-disclosure to regulators of the material failure of the critical modular construction approach dates from this earliest period of the project. The utility and its partner's documented recitation of the troubled early history of the project, with emphasis on the failure of module production and multiple design issues as primary sources of project delays, was documented in a detailed demand letter from SCANA and Santee Cooper CEOs to Westinghouse on May 6, 2014. H. Ex. 11, MNC-6. That letter noted that "events since May 23, 2008, [signing date for the initial EPC contract] have tested our resolve," at p. 2; asserted in bold, all CAPS, that "**OUR FRUSTRATION CONTINUES TO MOUNT**," p. 13; and concludes by asserting that "the Consortium's unexcused project delays constitute breaches of material provisions of the EPC Agreement." p. 14. Was this material information bearing on the prudence of project management also withheld from the regulators? Finally, an independent third party assessment of the project by Bechtel documented serious mismanagement by both the vendors and the utility, poor construction productivity, seriously lagging construction completion rates, serious problems with engineering constructability, among other problems; all leading to a high probability that the project completion dates would slip as much as 26 and 32 months, respectively, beyond the current schedule, imperiling

Production Tax Credit eligibility for both units at a loss of over $2 billion. Many of these findings by Bechtel were scrubbed from the final Bechtel Report. None of this critical information bearing on the prudence of project costs and completion was disclosed to the regulators when they were making key regulatory decisions on the project's budget and schedule.

70. It has recently come to light that Santee Cooper, the owner of 45% of the Summer 2 & 3 capacity, had commissioned a study of the economics of the project, which reached exactly the same conclusion as Dr. Cooper did at roughly the same time. The fact that Santee Cooper, a publicly owned utility, determined that it needed to exit the project early, may reflect its unique situation, but the fact that it could not find a utility (public or private) to buy out its share of the project (or the power from it), speaks volumes about the dire condition of new nuclear construction. For example, as Dr. Cooper pointed out in his direct testimony in 2012, the CEO of the nation's largest nuclear utility was very publicly stating that new nuclear reactor construction made no economic sense.

71. Santee Cooper's dissatisfaction with the project and the troubling bind in which it found itself are instructive for the analysis of imprudence and the denial of cost recovery. Santee Cooper had to get out of the project because they do not have the luxury of separating stockholders from ratepayers. The strategy of sticking it to ratepayers, but not stockholders, is not available to them. The fact that other investor-owned utilities would not buy the project, even though they could place the impact on ratepayers, suggests that the project was simply uneconomic from the point of view of both public-power and investor-owned utilities.

72. The utility's refusal to look at reality afflicted its demand growth assumptions underlying the project; and Dr. Lynch staunchly defends those projections. H. Ex. 11, MNC Rebuttal-5 shows that Lynch's demand forecast is simply indefensible when confronted with reality. This point was noted by the Santee Cooper consultant. Howard Axelrod:

> A dramatic reduction in demand growth reinforces this conclusion because natural gas plants can be added in smaller increments and shorter time periods, resulting in a better fit between need and capacity…. That reduction in demand equals substantially more than half of the capacity the nuclear project will bring on line for SCE&G. This will result in a sharp increase in capacity above the reserve margin requirement, which increases the cost to ratepayers. Adding smaller increments farther out in the future reduces both the level of capital spending and the present value of the revenue requirement.

The AARP witness Rubin reaches a very similar conclusion as Dr. Cooper did.

> There is no question that in March 2013, and the months leading up to that point, numerous utilities had rejected the NND Project because it was not economically viable or not consistent with their provision of low-cost service to customers. While Dr. Axelrod tweaked various assumptions to try to show that nuclear power could be cost competitive with natural gas, Santee Cooper did not find any utilities that agreed. Faced with this information in March 2013 (when the NND Project was less than 50% complete), coupled with the significant construction delays and deficiencies that still had not been remedied, it is my opinion that a prudent utility would have declined to spend more money on the Project.
>
> Indeed, as Dr. Axelrod stated, power prices during peak demand periods were expected to be $50 per MWh or less through 2020, while the NND Project (assuming no more cost over-runs or significant delays) would cost on the order of $100 per MWh. Several other utilities in the region rejected the NND Project because it was not a prudent investment for them. SCE&G should have acted prudently and done the same in March 2013.

73. Several points in this observation should be emphasized.

First, the failure to find a potential buyer reflects the sad state of the "nuclear renaissance." The dozens of utilities that had expressed initial interest in the federal loan guarantees, had been winnowed down to less than a dozen and a half who filed license applications and only two (Summer and Vogtle) that had gone into construction.

Second, it is interesting to consider how the Santee Cooper consultant Axelrod "tweaked various assumptions to try to show that nuclear power could be competitive." The outcome could only exist in the alternative universe of the utility tooth fairy. Such erroneous "tweaked" assumptions include:

Construction costs had to stabilize, not increase by at least 50%;

Natural gas prices had to rise to the cost plus 50% scenario, not fall to EIA minus 40%;

Carbon emissions addressed (taxed) by federal policy, which never happened;

Economic recovery accelerated demand, which did not happen.

74. The most important point, as Dr. Cooper emphasized throughout, is the cost escalation. Under the base-case assumptions, gas was less costly in 88% of the cases. With a 50% increase in costs, it never wins, even if the other assumptions are more favorable to nuclear. The point of a prudence review gets directly at this issue, since its primary purpose is to protect ratepayers from abuse in a situation where the utility is inclined to pursue projects or incur costs that are in the interest of stockholders, but not ratepayers. It is exactly this function that was undermined by the withholding and candy coating of data about the project.

75. As bad as things were at the end of 2012, they went downhill from there and all of the negative factors that Santee Cooper feared were evident: nuclear costs escalated, while the cost of alternatives continued to decline, the recession ended and economic growth returned, but demand for electricity remained stagnant and the need for the project evaporated. Dr. Cooper's analysis of the deteriorating economics of Summer was published in the summer of 2017, with a similar analysis of its sister project, Vogtle, in 2018.

76. Thus, at least by the end of 2012 it was time to exit from the project (as Santee Cooper was trying to do). Whether the PSC would have told the utility that it was imprudent to continue wasting ratepayer money before that point, if they had been given a complete and unvarnished description of the dire straits of the project, it cannot be said. But that was a right moment to quit and the failure of the utility to fully inform the PSC demands that the PSC disallow costs after that point, independent of the question of pushing disallowance back to the beginning.

**77.** A realistic estimate of the nuclear project costs would have led to a recognition that the project was uneconomic; and it appears that, at the time, everyone knew this, except the utility and the vendor, who were already arguing about who was responsible. There was little, if any chance the reactors would ever be economic. The consultant hired by Santee Cooper, Howard Axelrod, concluded as much in his economic analysis. The failure of any utilities to offer to take over Santee Cooper's share of the project attests to the common knowledge of the uneconomic nature of the project.

78. John Rowe, the chairman of Exelon, the largest nuclear utility in the nation, had loudly declared in March of 2012 that the so-called "nuclear renaissance" was dead on arrival:

> Nuclear power is no longer an economically viable source of new energy in the United States, the freshly-retired CEO of Exelon, and America's largest producer of nuclear power, said in Chicago Thursday. And it won't become economically viable, he said, for the foreseeable future.

Exelon's analysis had been showing this for several years and he made his point by showing the cost of carbon abatement, which undercuts Lynch's claim that nuclear power was necessary to meet the need to reduce carbon emissions. Examples of Exelon's forward-looking analysis from 2010 and 2011, were cited by Dr. Cooper. H. Ex. 11, MNC REBUTTAL-2.

79. If the PSC had been given a true picture of the state of the project at the time, it would have been better able to see the true location of nuclear power on the supply curve of low carbon resources. As Dr. Cooper said in his 2012 testimony:

> Inexplicably and in direct contrast to its own risk analysis, the company treats nuclear costs as though they were a certainty and fails to consider future cost overruns or increases in escalation. This could add billions to the nuclear scenario revenue requirement. A twenty percent increase in the construction cost could tip more than half the scenarios considered by SCE&G in favor of natural gas.

Here it is important to stress that the first pillar on which his recommendation for abandonment rests was the cost overruns, which interacted with other failures of the utility to recognize reality.

80. Second, the parental guarantee that Toshiba gave to the utility to resolve its mismanagement rightly belongs to the ratepayer, since they are the ones who would

bear the cost of mismanagement. If that sum is returned to ratepayers and all post-2012 expenditures are disallowed, the cost imposed on ratepayers would be a few hundred million dollars, and come close to wiping the slate clean compared to the amount the utility has proposed to recover. These alternative remedies are available to the Commission to adopt toward providing deserved ratepayer relief.

81. The utility's abandonment defense is one of the worst examples imaginable of the "to go" scam.. If pigs could fly, the construction of Summer Units 2 & 3 would have been economic, but they cannot. The utility bought the pig, fed it almost $5 billion, about 80% of the original cost estimate, and wants to collect billions of dollars with interest, even though they now say it is inedible and ratepayer won't get even one slice of bacon. Utility stockholders will get some flesh to feast on, not from the pig, but from the hide of the ratepayers.

82. That the company now finds the reactor uneconomic and needs to be abandoned is not surprising, since Dr. Cooper showed in 2012 that it was uneconomic and should be abandoned and his client argued in 2008 much the same. What is surprising is the effort to insist that it made economic sense to start and pump money into the project for a decade. At key past decision points, it should have been clear to a prudent decision maker that the plant should be abandoned, but the utility kept signing new agreements, in 2008, 2012, and 2016, accepting higher costs in spite of clear evidence that the prudent course of action would be to abandon the project.

83. The flip-flop between 2016 and 2017 is jolting, but was inevitable. It appears that the vendor did not have a credible, executable schedule for at least eight years. Worse still, the utility never fully informed the regulator of the intense problems of the

construction process, even though its internal documents now indicate just how bad things were.

84. The most recent economic analysis is more a regurgitation of past mistakes than anything else. The utility insists that "if" things had gone as its probabilistic projections had gone in 2008, 2012, and 2016, it was prudent to continue. Unfortunately for the utility, the construction of new nuclear reactors did not exist in the fantasy world the utility created, it must exist in the real world. The assumptions needed to support the utility's conclusion were totally unrealistic and imprudent. The chances that the utility's analysis was correct were slim to none and no prudent decision makers would have bet their company against such odds.

85. It now turns out that in order to maintain the fiction of prudence, the utility had to hide the facts from the Commission and ultimately cook the books. Any earlier decisions finding the construction to be prudent are undermined by this misrepresentation of the chaos that afflicted the project from the outset, but the decision themselves were undermined by mismanagement of the project, misunderstanding of the economic reality in the electricity sector, and misinterpretation of the BLRA.

86. The breadth and depth of the errors in the utility's analysis was remarkable. It is not just one assumption that the utility made in contradiction of the clear real-world evidence, every assumption went wrong, from the beginning of the project. The utility has repeated all of the mistakes pointed out in Dr. Cooper's 2012 testimony and which were identified in Friends of the Earth's 2008 testimony. Rather than simply repeat his demonstration that each of the prior conclusions was wrong, Dr. Cooper focused on the

major errors that the utility made early and simply repeated over and over again, as Dr. Lynch's testimony in this proceeding shows.

87. The first big, repeated error was rising construction costs. The utility never got control of costs. The farther the project advanced in the construction phase, the more rapid the cost overruns became, repeating the historical pattern that plagued the nuclear power industry throughout its 50-year history of commercial construction in the U.S. From 2012, when Dr. Cooper's testimony showed that the reactors were already uneconomic and should be abandoned, until 2017, when they finally were abandoned, the projected costs increased by at least 50 percent. In the abandonment application the utility concluded that the cost of the project would be $1.1 billion higher (net of the Toshiba parental guarantee) than the fixed price it had agreed to. It was admitting more execution risk just a year after accepting a lower cost. The historic pattern of continually rising cost over the course of the nuclear plant construction phase was not (or should not have been) news to the utility. That was the historic pattern and that was the problem the utility quickly faced, but failed to control.

88. The second big repeated error is natural gas price estimates. Lynch notes that the 2008 projection for natural gas in 2018 was over 450% higher than the observed prices. Having noted this remarkable misestimation of gas prices, he goes on to point out the current gas price plus 50%, which has consistently been the utility's preferred (and grossly overestimated) preference. H. Ex. 11, MNC-10 shows that the "plus 50%" estimate is well over 50% higher than the current future price of gas. The utility never got gas prices right because its analysis collapses with realistic prices.

89. The third big, repeated error is the overestimation of demand. The utility continues to project demand growth that is far above what has been observed since the project was proposed. As shown in H. Ex. 11, MNC-11, the construction of the reactor is pure waste, when realistic growth is assumed.

90. The fourth big repeated error is the failure to give full consideration to efficiency and renewables. The utility continues its baseload bias. Efficiency and renewables are an afterthought and a nuisance. As shown in the upper graph of H. Ex. 11, MNC-12, the cost of alternatives has plummeted, while the cost of nuclear has skyrocketed. The utility never incorporated the potential for renewables into its analysis. As shown in lower graph of Exhibit MNC-13, the utility model assumes that the nuclear reactors crowd out the alternatives. The addition of solar power ceases, as does firm purchased power, when the reactor enters the resource portfolio, in spite of the fact that these alternatives are much less costly. Efficiency and DSM limp along, far below what can be achieved and has been in other states. Thus, the marketplace and technology risks that argued against the project continue to do so, but the utility continually ignored them.

91. Its judgment on the other risks, once again, proved to be faulty. Its judgment on the price of carbon was also off the mark. The U.S. has imposed no price on carbon as policy. Perhaps there should be one, but even if there were, nuclear reactor construction is the most expensive way to decarbonize the sector. As shown in H. Ex. 11, MNC-14, which summarizes the most recent calculation of a well-respected independent analyst who has been providing consistent analyses since the first days of the Summer project, nuclear is an extremely expensive approach to carbon abatement.

92. Thus, we can draw a direct line explaining the imprudence of this project from its inception to its abandonment with reference to the risk factors that the utility misunderstood and its mismanagement of a complex project. The suggestion that the project had to be abandoned because Santee Cooper pulled out is absurd. Santee Cooper pulled out because the project made no sense. They recognized that the pig could not fly first and that they could not any further shift the cost of failure onto ratepayers in order to protect the owners of the project, since the ratepayers and owners are one and the same.

93. The "to-go" scam is a policy game that tries to show that net of sunk costs, it is best to continue the project. This is a process in which utilities waste billions of dollars but come to the commission promising to hold the line on costs. If they do, they claim the remaining costs on the reactor (the "to-go" costs) are less than they cost of switching to an alternative. Of course, they never hold to their cost estimates so the whole exercise was scam. In the case of SCE&G the numerous, erroneous and unsupportable assumptions used cast further doubt on the exercise.

94. In his direct testimony in 2012, Dr. Cooper noted that "time is of the essence." Because of the structure of the BLRA, the longer the utility delays in accepting the fact that the nuclear reactors are no longer the least cost option, the heavier the uneconomic burden that will be placed on ratepayers and the state economy. Under the BLRA, the utility can charge ahead and complete the project in spite of the fact that it is not economic and there is nothing the Commission can do to stop it from recovering the costs approved up to the original cost (with inflation adjustments). The only thing it can do to protect the ratepayers from harm, is require

the utility to do the proper economic analysis and reject the recovery of cost overruns, since increasing the cost of a project that is already not economic is the height of imprudence. In a sense, the BLRA is no different than the long history of cost overruns in the nuclear industry.

95. In the 1970s and 1980s, utilities signed cost-plus EPC contracts and discovered that schedules were slipping and costs were rising. They would go to utility regulators and lowball future costs, so they could argue that the combination of sunk and future costs of continuing construction were lower than abandoning a given project and pursuing an alternative. Shortly (a year or two later), they would return to the regulator and claim that costs had escalated. Again, they would project another modest increase in costs which, combined with the new higher level of sunk costs, would still be less than the cost of alternatives. By repeatedly underestimating "to-go" costs, they could keep the project going and justify ever increasing levels of uneconomic sunk costs. Eventually, the costs rose so high that utility commissions shifted the risk of future cost overruns onto utilities. Nuclear construction came to a halt.

H. Ex. 11, MNC-15 shows how brutal the "to-go" scam was for ratepayers. It shows sunk and "to-go" costs at the key decision points. At year end 2012, when the utility asked for a cost increase, it had sunk about $2 billion and claimed about $3.8 billion more to go. Four years later, when it inked the fixed price contract with the vendor, it had sunk about $4.6 billion and claimed about $3 billion more "to go." In other words, while $2.6 billion was spent, the "to go" costs came down only $0.8 billion. From the ratepayer point of view, 70% of the expenditures had been wasted, since it did not represent progress toward the final goal. About a year later, when the company again

made a big decision, this time to abandon the project, another couple hundred million had been spent, but the utility now projected final costs would be about $1.1 billion more than thought at the signing of the fixed price contract. At that point, with the increase in sunk costs approaching $3 billion, the "to go" costs were higher than they were in 2012. Ratepayers had lost ground. Toshiba already recognized that the project was beyond its means to complete under the contract and it exited, and for good reason. The history of nuclear power and the history of the project provided powerful evidence that the cost escalation was far from done. In fact, just a year after taking the Vogtle project over, Southern Company announced that its costs had already increased by an amount equal to the sum SCE&G had added to its cost estimate. Thus, there was a sixth, repeated error in the utility's analysis: it kept assuming the recovery of sunk costs by imposing them on the gas scenario.

96. In Dr. Cooper's professional opinion, for the reasons given all of the costs incurred by the utility for the abandoned nuclear project should be disallowed as imprudent pursuant to the BLRA and generally accepted principles of utility regulation.

To blend phrases from the 1985 *Forbes* and the 2017 *Engineering News-Record* "only the blind, or the biased, can now think" that the cost overruns are done, or that the power from these new reactors will be anything but a huge economic "disaster" and a management "fiasco." In fact, the history of nuclear power and the history of the project were powerful evidence that the project certainly should have been abandoned in 2012, when Dr. Cooper recommended as much. Had the utility described the reality on the ground at that time, the PSC could well have pulled the plug. Indeed, given the very early facts on the ground and the clear history, it can well be argued that signing the

EPC was imprudent, which Friends of the Earth argued in 2008 when the utility put it before the PSC.

97. Throughout this period, the company made unrealistic assumptions to keep the project going and keep sinking costs by misestimating the “to go” costs. If it recognized that it had failed to get control of costs, the uneconomic reality would have been clear. If it used realistic gas prices the uneconomic reality would have been clear. If it had used realistic estimates of demand, the uneconomic reality would have been clear. If it had given full consideration to the alternatives, the uneconomic reality would have been clear. If it had admitted that there was no tax on carbon, or policy to impose the social cost of carbon, the uneconomic reality would have been clear, and even if there was one, nuclear reactor construction was the most expensive and dirtiest way to respond. If it had not imposed the sunk costs on gas, the uneconomic reality would have been clear.

98. As Dr. Cooper showed in his 2012 analysis of the utility’s original decision to undertake the project and in his dismantling of the utility’s 2012 analysis, introduction any one of these realities into the analysis would have dictated abandonment. Taken together, they reflect a monumental failure and constitute massive imprudence. If the truth of the chaos of the project had been revealed, the prior prudence reviews might well have come out differently and the abandonment decision opens the entire history to scrutiny.

99. Finally, the claim of dire consequence if the Commission disallows any abandoned project costs is also a fiction, for three reasons.

First, SCE&G takes a remarkably narrow, pro-utility view of costs. It cautions that any disallowance will raise the cost of capital However, the cost of capital is only part of the burden that the construction of an uneconomic facility imposes on ratepayers. Ratepayers are also forced to pay for an excessive amount of capital, which has two components in this case: excess capacity and huge cost overruns. SCE&G fails to note that this project doubled the rate base of the company even before it suffered the cost overruns and it produced reserve margins that were twice the required level. Abandonment of the project could lower the amount of excess capital in the rate base by much more than the increase in the cost of capital. Ratepayers could be better off with disallowances.

Second, SCE&G assumes that ratepayers can be forced to swallow sunk costs at triple or quadruple the cost of new generation being achieved elsewhere without any consequences. That assumption is dubious. Ratepayers forced to absorb such excessive costs will resist. The first line of resistance will be from large users like Walmart. Given the widespread availability of decentralized alternatives, these customers will seek to self-supply significant parts of their demand. Residential ratepayers will push for the same option. Demand will decline and the utility will enter into a death spiral, as it tries to make up for lost revenue with rate increases added atop the sunk costs. This threat of the “death spiral” stems from the existence and availability of lower cost alternatives that the utility refused to consider in its economic analysis. Notwithstanding the utility’s myopic view, the alternatives exist in the real world. Ratepayers might be better off with disallowances.

Third, abandonment and disallowance might actually be easier for the market to deal with and have a smaller impact on the cost of capital than SCE&G surmises, for other reasons (i.e. in addition to the fact that the burden on ratepayers is alleviated). The construction of a single facility at such high cost, with so much excess capacity, representing a capital outlay equal to the entire value of the company was a singularly imprudent thing to do. This was a one-shot mistake that the utility is not likely to make again for decades. That is, there were three decades between the mistakes made in the nuclear fiasco of the 1970s-80s and the mistakes made in the failed "nuclear renaissance." Given that 90% of the reactor projects discussed during the "nuclear renaissance" never got into the construction phase, investors can be fairly confident that the utility will not make a similar mistake soon. Current investors have paid the price, but future investors do not have to punish the stock for a mistake that is not likely to be repeated.

## CONCLUSIONS OF LAW

By a preponderance of the reliable and probative evidence on the whole record the Commission concludes that:

1. The Baseload Review Act (BLRA) is unconstitutional as applied where it takes money from ratepayers and gives it to investors of a private company for a private use for a utility plant which is now abandoned and not "used and useful" in producing utility service to ratepayers, contrary to the public interest and in violation of Article I, Section 13(A) of the South Carolina Constitution;

2. Where the Baseload Review Act is unconstitutional as applied, all actions taken thereunder are void as a matter of law; and the parties must be restored to their circumstances prevailing prior to the issuance of Order No. 2009-104(A). SCE&G must cease collecting any and all revised rates approved pursuant to the BLRA. The Commission will set a hearing to determine the manner and terms by which SCE&G will refund to its ratepayers all rates charged pursuant to the BLRA by credits or otherwise.

3. Where SCE&G was and is no longer constructing the nuclear plant within the parameters of the Commission's cost and schedule order it is no longer entitled to charge rates or recover costs of that abandoned plant, pursuant to the BLRA, S.C. Code Ann. Section 58-33-275(A).

4. Where SCE&G has fraudulently lied, misled and withheld material information regarding the prudence of the nuclear project from ORS or the Commission contrary to the requirements of the BLRA , S.C. Code Section 58-33-220, Act 258 (2018), it is not entitled to recover costs of the abandoned plant.

5. Where SCE&G has failed to carry its burden of proof, pursuant to the BLRA, S.C Code Section 58-33-280(K), that it was prudent to delay abandonment of the nuclear project until July 31, 2017, instead of ten years earlier, it cannot recover the costs of the abandoned project.

6. Where the information available to the utility demonstrates that the capital costs incurred for the abandoned project were imprudent such costs may not be recovered pursuant to the BLRA, S.C Code Section 58-33-280(K).

7. Where the evidence of record reflects misconduct by SCE&G in its fraudulent dealings with its regulators- the Office of regulatory Staff and this Commission; and the potential for future ratepayer abuse, any merger approval must be conditioned in order to protect ratepayers and to better assure an energy future founded on efficiency and renewable resources at just and reasonable rates. The Merger Commitments and Conditions, H. Ex 171, proposed by ORS and other allied parties are hereby adopted as conditions to any merger of SCE&G and Dominion Energy.